

APRIL, 1967. 40¢

VOL. 11 NO. 12

PRECISION SHOOTING

a magazine for Shooters by Shooters



PRECISION SHOOTING

PUBLISHED MONTHLY BY PRECISION SHOOTING, INC.

Editorial and business office at
Lyndonville, Vermont 05851.

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Subscription rates:—To the U. S., Canada and Mexico, 1 year \$4.50, 2 years \$8.00. All other countries \$1.00 per year additional. Change of address requires 30 days' notice.

Place of Publication—Cowles Press, Inc., St. Johnsbury, Vt. Second-class postage paid at St. Johnsbury, Vt.

COVER PHOTO

Members of the Fort Benning Rifle and Pistol Club "Powder Puffs" that set six national women's pistol records at the Mid Winter Warm Up matches at Fort Benning February 25 and 26. Left to right are SSG Barbara Hile, Maj. Sallie Carroll (National Woman Pistol Champion), Maj. Carolyn Reinhold and Lt. Stephanie Mudge.

Full report of the matches are elsewhere in this issue. U. S. Army photo

A BOOK REVIEW OF Los Proyectiles Y Sus Efectos

Tomo I-IV

Gonzalo J. Fernandez

By Edward M. Yard

This Spanish language work is a compendium of firearm information. Starting in Tomo I with a compact historical review of guns, we move quickly into the technical study of small arms and their ammunition. The range and depth of this study exceeds anything in the literature here that this writer is aware of. Anyone wanting to build a basic knowledge of small firearms and their ballistics should obtain these works. Nothing else in print so succinctly covers the field. It may seem strange to recommend books in Spanish to you, when relatively few shooters are proficient in any second language. You will find these books so clearly written that, if you have any knowledge of firearms, you can easily follow this text with a minimum of Spanish (I haven't had one minute of instruction or any exposure to this language while finding these books easily understood).

The author, Gonzalo Fernandez, is a medical doctor writing with Centro Militar del Uruguay as sponsors. He has engaged in extensive research to bring together so complete a review of everything pertaining to his subject. A glance at his bibliography would reveal a dedicated study of the field. And any skimming of his books will

show a scope not to be duplicated. To anyone interested in a serious study of hand fired guns, their effects and capability, these works are indispensable. I can recommend them unreservedly; they are nearly mandatory.

Dr. Fernandez goes into his subject scientifically from the very basic elements of it, but with a lucid simplicity that reveals the essence of ballistics to even the amateur. He starts the consideration of guns and ordnance by classifying caliber nomenclature from history to current practice. And he follows this with a review of powders. The basic physics and the chemistry gone over in this portion exceed other sources in our books. The physical chemistry (thermodynamics) of powder burning and explosion are well treated. Anyone having a real interest in internal ballistic theory could buy these books for this section alone.

The chapter dealing with methods of ignition and primers is worth anyone's study. The lack of general knowledge about primer requirements hampers him as it does you. But you may still learn from his comments on this.

Unless you are pretty well versed in cartridge lore and the development of cases, you'll learn quite a bit from the chapter "La Vaina" exploring the history and art of containing firearm charges in units, starting with the combustible cartouche. Most variations of head type and main constructions are covered right through the Dardick trounds. Case types are illustrated, and head types defined. A section covers head stamps. And a listing marks versus company is given at the end of the first volume. And the list is for most countries in this manufacture, and not just the U. S. A. and England.

The review of powders and types now on sale is as good as anything we have in our periodicals. It forms a good permanent guide to propellant capacity. It is true that most of this data was taken from our literature, but it is also true that it has been organized with considerable skill. There is a lot of information to be gained here in a short time.

The chapter on ignition is very thorough and is well written. It illustrates a large variety of primers and priming means. The composition and characteristics of fulminates is discussed both historically and in current practice. The use of primers to estimate pressure is thoroughly covered. We'll admit you need not go to foreign literature to learn about that, but this material is better organized than anything else I have seen.

More than half of Tomo II is devoted to bullets and their construction. Information about the effects and effectiveness of various types is included, as well as ballistic data. The second half of the volume describes the history and development of cartridges. And covers the performance of

many popular sporting types as well as major military rounds.

Tomo III and Tomo IV in eight chapters deal with cartridges by type from shotshells to wildcats in great detail. Commercial and reload ballistics are listed. A large number of cartridge constructions are illustrated and described. This is not an Ackley or Sharpe handbook section. It is composed from the point of view of a textbook for anyone having a serious, or a professional, interest in firearms and ammunition for them. The section on wildcats is 46 pages long and amazingly complete for a work of this type, including a list of the better known ones charting their derivation from parent brass. You may believe it that he is thorough when you note that he even gets down to some of my creations.

These four volumes are extremely well organized and written. They will make a worthwhile addition to any library on firearms. For any serious student of small arms ammunition, they are a must whether he speaks Spanish or not. A basic vocabulary on a single card and a knowledge of the subject matter will take you through these very lucid books. For the many shooters who do read the Spanish language, they will prove a big addition to their file of information. I would urge anyone who is interested in the subject to get a set. They'll be a collector item one day, and you'll wish you had.

The exact title and publication details are as follows:

LOS PROYECTILES Y SUS EFECTOS

Armas Portatiles Militares, Deportivas
De Caza Y Defensa Personal

By Gonzalo J. Fernandez,
Medico Neurologo

Centro Militar, Republica del Uruguay
Write to Departamento Editorial
General Artigas
Av. Agraciada 1546
Montevideo, Uruguay, S. A.

POWDER SELECTION FOR MORE UNIFORM PISTOL LOADS

By F. Warren Cloninger

To become a reasonably proficient pistol shot requires a great deal of practice. This is particularly true of the shooting done with the center-fire and .45 cal. pistols.

Because of the cost of this ammunition most pistol shooters are forced to load their own ammunition and to load this ammunition in much larger quantities than that loaded by most rifle shooters.

In order to load the quantities needed most shooters employ as much equipment as possible to speed this operation. Many use automatic or semi-automatic loading machines that produce a loaded round with as little individual handling of the components as possible and in nearly all cases will at least employ a powder measure. Seldom will they weigh individual charges

unless loading some "super" slow fire loads.

One of the most universally used powders is Bullseye, a very fast powder requiring small powder charges. A typical 45 load being 3.5 grains.

I have checked several of the common brands of powder measures in use today and while they are quite accurate it is not unusual to find when weighing 100 charges thrown by the various measures to have a variance of plus or minus .1 grain.

Tests show that loads varying from 3.4 to 3.6 of Bullseye (a 5.7% variation of charge weight) will considerably enlarge the group size at 50 yards over groups fired with carefully weighed charges of 3.5 grains.

One solution to the problem is to weigh all powder charges, but this is not practical in the quantities of loads required.

One other solution that does not eliminate this problem but does help to reduce it is to switch to a powder that will require a larger charge to do the same job.

There are several powders that work equally well and measure just as accurately but require from 1/2 to 1 grain increase in charge weight to obtain the same result.

As an example, in testing some loads of 4.5 grains of Hi Skor 700X I had for all practical purposes the same velocity that I had with 3.5 grains of Bullseye and the same size groups.

In weighing charges thrown by my powder measure I had the same variation of plus or minus .1 grain, but the variation as a per cent of charge weight was reduced from 5.7% to 4.4%.

Groups fired using loads ranging from 4.4 to 4.6 grains gave somewhat smaller groups than those I mentioned ranging from 3.4 to 3.6 of Bullseye.

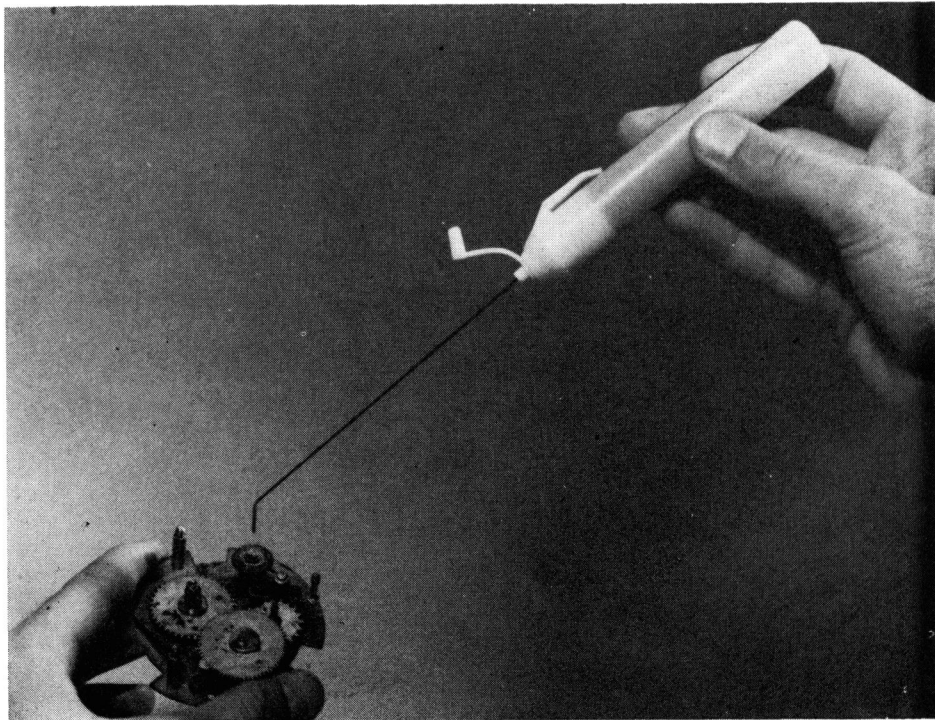
While 1.3% is not a large amount it is a significant reduction of a variable, at least enough that it may warrant some experimentation by other shooters if they have not already done so.

The cost of the loads are increased slightly due to the larger amount of powder consumed.

ARMITE PEN INSTRUMENT OILER

The Armite pen instrument oilers feature a needle-thin .035" stainless steel tube which extends and retracts. It can reach inside any mechanism and dispense a drop or a fraction of a drop up to 9 1/2 inches from the user's hand. The fluid travels through the tube and is controlled by finger tip pressure. The tube has an angled end to allow reaching "around corners" and gets to hard-to-reach areas. It can be carried in a tool kit or shirt pocket by means of a convenient pocket clip.

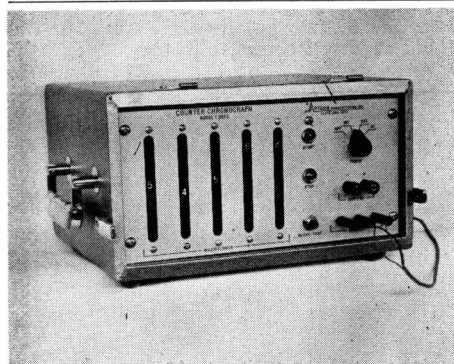
I purchased one of these oilers and I consider it a desirable and convenient item for a shooter's kit. The oil container is of heavy plastic and is refillable. The oilers may be purchased empty, to be filled with an oil of the user's preference, or it



The Armite Pen Instrument Oiler

may be filled with special oils supplied by Armite. These empty oilers are relatively inexpensive. If you cannot obtain these oilers locally, write to ARMITE LABORATORIES, 1845 Randolph Street, Los Angeles, Calif. 90001 for further information and price of this and other items useful to shooters.

P. H. T.



The new Avtron Professional model chronograph.

A NEW AVTRON CHRONOGRAPH

A new professional model counter chronograph has just been announced by Avtron Manufacturing, Inc. The new model T333C is completely transistorized, and comes equipped for use with either expendable screens, or photo-electric screens, operates on internal batteries, 12 volt car batteries, or 115 volt AC line power. The professional model has five decades, and while similar to the well known T333A, has a wider application, especially for those interested in time of flight measurement.

Write to Avtron Manufacturing, Inc., 10409 Meech Avenue, Cleveland, Ohio 44105 for full information, prices, etc.

P. H. T.

M. R. L. FIFTY SHOT CHAMPIONSHIP

The traditional fifty shot smallbore rifle championship of the Metropolitan Rifle League, New York City, was fired February 19th on the II Corps Armory range in Brooklyn with 65 shooters competing.

This match has been fired annually on a weekend nearest Washington's Birthday since 1922. The course of fire has been 50 shots at 100 yards, indoors, with small-bore (.22 rim fire) rifle all this time, with the exception of a couple of years during World War II when a 100 yard indoor range was not available and the 50 shots were fired at 50 meters, indoors.

That first match in 1922 was won with a score of 492 X 500. (There was no X-ring on the 100 yard decimal smallbore target at that time.) No 500 point possible was shot until 1930, when two were fired. Charles H. Johnson winning with 36 X's and Edward Smelter taking second place with his 500 score. In 1931, Larry Corsa won with a score of 499-500.

This year (1967) twelve shot scores of 500 and 9th, 10th and 11th ranking scores all had an X-count of 36.

Joseph Barnes, Jr. (who fired the 3200 iron sight record at Camp Perry last summer) is the 1967 Fifty Shot Champion. He, W. Ritchie, Lloyd Norton, F. Eichler and Carl Johnson (son of Eric the SWEDE) all fired 500-41X scores to rank in the above order.

The others with 500 scores, according to rank, were: L. Moore, F. Boyd, R. Oster, W. Tomsen, S. Tekulsky, A. Rosenblatt and A. Rahne. This year a score of 492 ranked in 58th place.



A tip of the hat and a scratch of the head seem to speak volumes as the National Pistol Champion, Donald Hamilton (left) tries to look modest as he receives the congratulations of MSG Wm. B. Blankenship (center) and MSG R. O. Thompson for his 2667-154 win of the Mid Winter Warm Up pistol match, held at Fort Benning February 25 and 26. U. S. Army photo

PISTOL RECORDS FALL AT FORT BENNING

Donald Hamilton, US Navy, the National Pistol Champion, showed true championship form last weekend (25-26 Feb.) by firing a 2667-154 to win the Mid-Winter Warm-Up Matches held at the Fort Benning Rifle and Pistol Club. Hamilton's victory was crowned with Open and Service Records in the Center Fire National Match Course, 300-20 and the Center Fire Aggregate with 894-57.

While the best pistol shooters in the Armed Services were hacking away at each other in a battle of tens and Xs, the Fort Benning Rifle and Pistol Club "Powder Puffs" powdered away at the bullseye and set six new National Women's Records.

The "Powder Puffs" started off their record firing with a 1061 score in International Rapid Fire followed by a 1911-33 for the Free Pistol. In the NRA Matches they fired 1127-27 in the .22 Match, 1072-18 in the CF Match, and 1094-18 in the .45 Match. Then they fired the Service Pistol and set a record 1075-23. Team members were Sallie Carroll, Carolyn Reinbold, Stephanie Mudge, and Barbara Hile.

The US Army International Pistol Team set a new Free Pistol Record with 2172.

Again, in the Service Pistol Match US Army fired a record setting 1168-62.

The Champion Police Team from the Michigan State Police set three new police records. In International firing, they shot 2057 in the Free Pistol Match and 1118-60 in the Rapid Fire competition. In the Service Pistol Team Match they fired a 1126-43.

SSG D. W. Thyarks, USAF, set a timed fire record with the Service Pistol with 200-19. The Air Force Team fired 1167-91 for an Open and Service Record in the International Rapid Fire Match.

Olympic Champion, Major Franklin Green, won the .22 Caliber Aggregate with 891-51. World Champion, Bill Blankenship, came through for an 890-50 in the .45 Aggregate and a near record 886-45 to win the Service Pistol Championship.

US Army Blue won three team matches—the .22 Match with 1184-66, the Center Fire Match with 1178-55, and the Service Pistol Match with a record 1168-62. The US Air Force won the .45 Caliber Match with 1178-51.

Major Sallie Carroll, the National Woman Pistol Champion, was high woman with a 2598-88. She fired 869-30 .22 Caliber, 869-28 CF, and 860-30 .45 Caliber.

In the duel between Hamilton and Blankenship—Bill fired an 887-47 in the .22 Aggregate to an 888-47 for Don. However, Hamilton powered through the Center Fire Match with a record breaking 894-57 while Bill shot an 879-49, his 890-51 effort in the .45 Caliber was not sufficient to put him in first place. Don fired an 885 and wound up with 2667-154 to Bill's 2656-145.

While the champion was battling away, a minor engagement between MSG R. O. Thompson and SSG Emil Heugatter was taking place. Heugatter overcame a deficit in his .22 Aggregate but was one point shy in the Grand Aggregate. Thompson won with a 2645-139 to Heugatter's 2644-120.

When the tally was made there were 29 scores fired over 2600 and 14 new records set, six by the "Powder Puffs," two by Navy, two by Michigan State Police, two by Air Force, and two by the Army.

MRL TEAM AND INDIVIDUAL MATCH

At the Metropolitan Rifle League two man Team and Individual match on March 12th in Brooklyn, N. Y., 25 teams competed and 54 fired the individual match, both matches fired at 100 yards indoors with smallbore rifles.

Rans Triggs and Joe Barnes won the team match with a possible 800-71x. They were crowded by E. Clausen and W. Tomsen who fired an 800-65x score. Carl Johnson and Lloyd Norton scored 799-67x and in fourth place A. and D. Rosenblatt had 799-53x.

Sixteen shot 400 possible scores in the individual match. Carl Johnson with 400-37x beat team-mate Lloyd Norton's 400-36x. Sam Tekulsky and F. Eichler placed 3rd and 4th, each with a 400-34x. J. Maher had the top ranking of five 400-33x scores to take 5th place.

Nine fired 800 possible aggregate scores, Carl Johnson winning with 72 X's over F. Eichler's 70 X's. Others shooting 800's, according to rank, were R. Triggs, J. Barnes, Jr., R. Lee, W. Tomsen, E. Clausen, S. Tekulsky and H. Stone.

EXAMPLE OF REDUCTION OF EXPERIMENTAL DATA

(An Experimental Ballistics Associates
Report by Homer S. Powley)

Most shooters have convinced themselves that, when it comes to guns, mathematics just doesn't work. The hobby magazines contain no genuine ballistics information and what is passed off for it is highly unreliable. Mathematics by itself is worthless unless used right. In Ballistics, nothing can be done until certain experimental things have been done. Then, mathematics is almost the only way to tell what is going on, and has to contain the results of the experimental work. So, all genuine ballistics is based on experiment

and the math is just a translation into usable information.

No measuring device has been made which is absolutely accurate. You may have one which reads to yeah decimal places but not to ten times yeah. Neither can you load absolutely uniform ammunition. So, one thing is certain when you get experimental results; the numbers are not exactly right. They contain errors, large or small, depending on many things. Something else is certain; small errors are more numerous than larger errors in careful work. This is definite and can be handled by mathematics applied to your figures so the errors can be minimized and you can see what the experimental results look like. If you doubt this, reflect on the jillions of dollars well spent by American industries for Quality Control. It uses math, but is really applied common sense.

You have read about the effects of changing barrel lengths in a 22 rimfire and the effects of friction in slowing down the bullet, but what is the velocity loss and how much does the friction amount to?

Here are some experimental figures for 22 match ammo quoted by Fred Ness on page 287 of "Practical Dope on the .22" (1947). The barrel length is in inches and we have converted Ness' instrumental velocities to those corresponding at the muzzle:

52—1134	31—1156	12—1166
47—1164	28—1161	9—1168
43—1150	24—1161	8—1128
39—1146	20—1150	4—1019
35—1153	16—1164	2—799

He also gives the change in zero according to where the gun was rested, but we want to know the answers to the questions. What about other figures quoted where the barrel lengths and velocities were given for different guns? Well, there are the figures, so what do you make of them?

If you have a lot of measurements on one item, you put them all together and get an average. The average of the readings tends to cancel out the errors and you have a good number to use. But, can you do something like that with these numbers to see how much they are out of line? Can you find the line, anyway? The answer is yes to both questions. Use the **Method of Least Squares**.

The first thing to do is to find a mathematical equation which will give you a reference line (or curve). Then the MLS gives the constants for the **best line** which makes all the deviations a **minimum** from the line. Now, you can select quite a number of curves and if you choose the wrong one you have the wrong answer. The MLS is a long process, but you have to wade through several until you find what is best.

Experience with other guns tells us that, at least up to some point, the increase

in velocity with increase in travel is normal, so we apply the Leduc equation. In order to find the constants for the equation, we use the MLS. It fits very nicely up to at least 20 inches but beyond that, we don't know yet. Leduc tells us that the maximum pressure producing bullet motion is 9410 psi; also that the limiting velocity is 1164 f/s. Taking a hard look at the data, we don't think this velocity is right, and especially since common sense tells us that if the barrel gets long enough, friction will slow the bullet down before reaching that limiting velocity.

Beyond 8 inches the velocities look more or less the same, so we want to see whether this is so. Just for this region we try a Least Squares fit to a Quadratic equation to see whether the line is straight or curved. We do find that it is a slow curve with the maximum velocity close to a 28-in. barrel length. Now we know that it is really a curve, convex upwards, so we have one answer. The maximum velocity in this gun occurs at a barrel length of 28 inches and the equation tells us the velocity here is 1158 f/s.

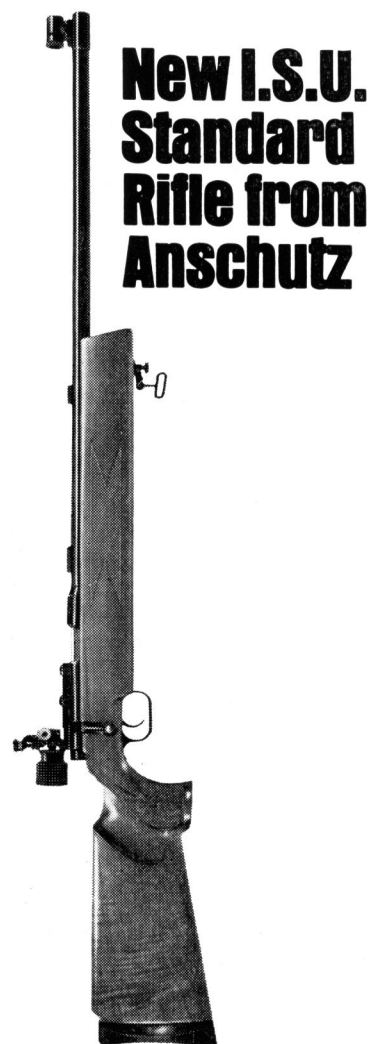
This is a fairly accurate figure because we have, **in effect**, averaged all the averages. The 28 figure is not as good because a 26 or 30 inch barrel would probably show the same velocity with more accurate chronographing and uniform ammunition. Here the velocity is not changing very fast. From the Leduc equation which is good at least this far, we find that the pressure on the base of the bullet is 157 psi, but the bullet is no longer being accelerated. This pressure is just what is required to overcome barrel friction. This is the other answer.

A 22 bore has an area of about 1/25 of a square inch, so this means that a force of 6.1 pounds is what is required to overcome bore friction. If you have ever slugged a bore with Lead, you have an idea of the force required to keep the slug moving after it is engraved by the rifling.

The force required to engrave the bullet is much higher, since starting friction is always much higher than sliding friction.

In the 24 inches between 28 and 52 inches of barrel, the velocity falls off according to another MLS trial just about in a straight line. The corrected average 52 inch velocity is 1145 f/s, so friction has slowed it down from 1158 to this; a difference of 13 f/s. No wonder it is hard to find velocity changes due to friction!

This is only one experiment and we have reduced the figures to the average performance of this ammunition in this gun according to one chronograph. There are many, many other places where our technique may be used to get better information from data, and ballistics is only one area where it is useful. This case was a little more difficult than some for getting the picture.



How can a rifle designed especially for international matches be just what U.S. smallbore shooters are looking for? Easy. The Anschutz people built a position rifle to meet the new International Shooting Union "Standard" classification. What they came up with happens to be ideal in weight and stock design for U.S. match requirements.

It's built on the same match 54 action that was used by 7 out of 10 of the smallbore shooters in the Tokyo Olympics (and all the medal winners).

The 1408 weighs about 10 pounds, easily meets the I.S.U. limit of 5 kilograms with sights. The single stage trigger, adjustable for weight of pull, creep and backlash, is set for 500 grams (1.1 lbs.). A replacement spring is included to convert to a 3 pound pull for U.S. matches.

The 7/8" diameter, 26" barrel is precision rifled and hand-lapped for peak accuracy. The French walnut stock has adjustable butt plate, raised cheek-piece, contoured pistol-grip and a deep fore-end for position shooting. Full length swivel rail and scope blocks, **\$155**. (Sights extra). Left-hand stock, **\$167**.

For free full-color catalog, write: Savage Arms, Westfield 61, Massachusetts 01085. Include your ZIP code.



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"SHOOTING CONTRASTS"

(Following is Wm. R. Funk's translation of articles appearing in the Nov. 15 and 16, 1966 editions of "Soviet Sport," a daily sports newspaper published in Russia.)

Bill Funk comments: "In view of Mrs. Duncan's remarks in the Dec. '66 PS, these two articles are sort of timely, things look a little better for the Russian team than our own. I think that the articles are reasonably objective, from a rival's point of view; they don't show us in a bad light, at least as far as sport shooting is concerned. They might be of interest, either all or in part, to other readers of PS.

"At any rate, I have found the viewpoint of the other side very interesting; while we may not agree with their politics or methods (our own are not always above reproach) it surely won't hurt us to know something about them.")

Soviet Sport

November 15, 1966

"In reviewing events of the past season one involuntarily glances back—to the sad days, for our shooters, of the Tokyo Olympics. Now, one cannot believe that two years ago Soviet shooters could not attain results any higher than the ordinary. Many tournaments of this year, the World Championships and not long ago, the national championships give abundant food for thought . . .!"

Beginning with the year 1958 when the International Shooting Union changed over to the new target of a smaller size, our marksmen have not won a gold medal in small bore prone shooting in any international contest. In tournaments within the country where the competition was hot, the not very high results of 595 were considered outstanding.

But in the championships at Kiev the ice was broken. In exercises, where not long ago they were not sparkling, the attainments of the competitors exceeded the most bold predictions. V. Parchimovich approached the absolute record, showing wonderful results—599 points x 600. Three more sportsmen fulfilled the norms of a master of sport of the international class, getting 596 points. And, what is gratifying, among them was a 20 year old Dynamoer from Lithuania, A. Dauksha. I do not remember such a case, where a sportsman having 596 points was not even among the prize winners! (Note: refers to the first three places, the gold, silver, and bronze medals.)

The achievements of the riflemen in the prone shooting was not a single episode, for in the small bore standards "3x40" in this very same position once again was shown excellent results. Three sportsmen got 398 points, three—397, six—396, and ten—395. Such a beginning permits the placing of a solid foundation for the whole

standard, the peak of which should be somewhere around the 1160 mark. It seems incredible that in Tokyo our marksmen were not able to get 1150 points. Now it is another matter. The results, demonstrated at the national championships would appear favorably at contests of any international scale.

Consider for yourself, 20 year old Moscow Dynamoer, A. Savinkov getting 1150 points and having only 11th place to show for it. With sparkling skill A. Gerasimenok repeated the world record of the American L. Wigger (1164 pts.) established at the Olympiad in Tokyo. It is especially pleasing, that the level of 1150 points is now shown to be within the capability not only of the leading group of sportsmen, but also to those who are only now entering into major competition. Hardly anyone of the wide circle of fans of the shooting sport speaks the name of 27 year old DOCAAFER from suburban Moscow, V. Komleva or the 24 year old Ukrainian Dynamoer O. Doicho. But, you know, the first got 1157 points and the second—1156.

When you analyze the performance of the standardsmen in shooting from the small bore rifle, you see that, on the background of 3 position performance, the standing position looks relatively pale. The national record here equals 382 points. Only A. Gerasimenok was close to this attainment and only five barely got over the border of 370 points. The rest of the participants fell far behind. One cannot be reconciled with this, for in any competition, in the final analysis the standing score decides everything.

Attainments in the large bore standards "3x40" were also high. Appearing in brilliant form A. Gerasimenok again established an all-union record by getting 1158 points. Four sportsmen got over the boundary of 1150 points, and eleven competitors finished shooting with results from 1140 to 1150 points. One finds many youngsters in this group.

What is the reason for so successful a performance in this type of shooting? Previously it was often the case, that in shooting from the large bore rifle our "standardsmen" had significantly greater success than from the smallbore rifle. In their time many wrote about the shortcomings of this shooting. One of these, and perhaps the most important, was a shortage of a sufficient quantity of high quality small bore cartridges. Because of this sportsmen not only lost belief in high results, but simply became afraid of them.

For the last year the quality of domestic cartridges has improved, and although the quantity of them was insufficient at first, the leading sportsmen received them not only for record firing, but also for training. Confidence in the cartridges led to a sharp increase in the results of shooting from the small bore rifle. And this had a chain reaction effect on the achievements in the large bore (300 meter) standards as

well. The growth of skill grew quickly. Now there has appeared a group fairly young in years, but already sufficiently experienced sportsmen, who will be able to be in serious contention for the gold medals at the Olympiad in Mexico. In this group are included A. Gerasimenok, L. Lustberg, V. Parchimovich, V. Kornev and V. Konyakin.

It is somewhat different in the pistol exercises. In shooting from the small bore pistol at 50 meters we have always shown high attainments. Thus at the national championships E. Rasskassov raised the ceiling of the All Union record to 571 and at the Armed Forces Championship V. Solukvodze succeeded in getting 570. I have yet to mention that in different contests of the season there were shown many results exceeding 560 points.

The All-Union championship in this regard was an exception. More than 560 points was turned out by only two of the prize winners. However, the showing of a large group of participants was on a sufficiently high level and fairly close. Twenty two sportsmen got from 550 to 560 points. Among this group were the youths—23 year old Dynamoer, D. Muradiv; his fellow club member 18 year old E. Dotsenko, 20 year old soldier A. Erishin and others.

The attainments of the match pistol shooters in this season as in past years was sharply higher than in many international competitions. But, never the less in spite of the abundance of first class pistol shooters in our country, at this moment we can only speak of two sportsmen who have had fairly stable performances in international competition. These are V. Stolypin and G. Kosych. The hopes which were pinned on two other young, and unquestionably talented shooters—E. Rasskassov and A. Udachin, for the present have not been realized. Appearing successfully in the inter-union and the smaller international competitions, they did not pass the test of either the Tokyo games or the 1966 World Championships.

Joseph Esselson

Honored Trainer of the RSFSR

Soviet Sport November 16, 1966

"SHOOTING CONTRASTS"

Conclusion

In shooting at the silhouette the matter gets worse. Here, we can frankly say, there is nothing to boast about. For a long time our silhouette shooters have not been found climbing to the highest step of the victory pedestal in international competitions.

There are many reasons for the lagging behind in this exercise. Of these there is the absence of good weapons (E. Khaiderov's splendid pistol has been placed in production very slowly) and a shortage in the number of silhouette installations, the majority of which do not comply with the rules of competition. And the study of how to develop techniques is substituted for the coaching of sportsmen before a competition.

Thus in four exercises of the Olympic program we can see an obvious growth of technical results. It could be better. However we will not hurry to a conclusion and make a forecast. Let us turn to the 39th World Championship which was held in July of this year at Weisbaden.

At the World Championships Soviet shooters won in all 29 medals in the individual and team championships in the same time that the Americans received only 25 medals. This was interpreted as a great success for the Soviet marksmen.

But let us be self critical. In the first place, in the number of gold medals the American shooters led us. They won 14 gold medals, we—9. In shooting from the small bore rifle prone the Americans D. Boyd (598 points) and W. Krilling (596 points) occupied first and third place. Our very best M. Niasov (593 points) and Yu. Kudriyashov (591 points) were in 12th and 23rd place. In team scoring we lost to the Americans by 12 points.

In the small bore standard "3x40," G. Anderson became the world champion getting 1155 points. M. Niasov occupied second place lagging behind the winner by 5 points. In the team scoring we lost by 17 points.

In shooting from the large bore rifle G. Anderson (1156 points) and J. Foster (1153 points) occupied first and third place. Our A. Gerasimenok (1154 points) was second and L. Lustberg (1148 points) was sixth. In the team scoring we once again lost by 29 points. Only in the pistol exercise where V. Stolypin became world champion (556 points) were we victors. Especially weak was the performance of our silhouette shooters. They, it is true, won the team match, but in the individual championship R. Suleymenov (593 pts.) was only 3rd.

These are the facts. The question involuntarily arises: why, having such high results among ourselves at home, do we appear worse at major international competitions? For this year's World Championships, it is possible that the early date of the contests was of more than a little importance. Our sportsmen just did not have time to find their form. The small number of competitions before the championships had the trainers quite perturbed in attempting to diagnose the team correctly.

Judging the season as a whole, one can say that the technical preparation of our marksmen was not worse than the foreigners. It means that our weakness is elsewhere. It is in the lower psychological preparation of our shooters. Concerning this, we often create in our shooters a nervous condition due to an incorrect system of selection.

Let us observe how the system of selection is carried out for participants in major matches. It is long and many staged—members of a team proceed through a long schedule of controlled competitive

shootings. Each time there is some number of sportsmen who either quit the game or else they are forced out, but in any case they cannot recoup themselves in the following controlled shooting.

With such a system of selection the shooters planned preparation gets broken. They do not think of how to gradually get into form. The basic purpose "to stay with it" and to win over their competitors.

But even this is not all. At the gathering preceding the main competition when 5-6 men remain for 4 vacant places there is carried out a controlled shooting for bringing to light the principle personnel.

Such a system does not permit the selection of the strongest but does give the possibility of a "middle peasant" (colloq. average guy) falling into a place on the team.

It is advisable to select a team at one time, doing this about a month and a half previous to the championship or tournament by means of a meeting between the candidates. And in order to avoid the element of luck each exercise should be shot three times. According to these results would be selected the basic personnel and the alternates of a team.

The advantages of such a system are obvious. The personnel of a team would be made up of those who are in the best form at that time. Sportsmen could plan to prepare themselves for competitions properly, distributing the load in the course of the whole year. But mainly, marksmen will avoid a many-staged, exhausting selection and they will be able to calmly prepare themselves for the basic competition. Many members of the countries teams are highly in favor of such a system.

Much attention is merited to the question of participation in international competition. Here there is no strict system: when, where and with whom to meet or who should go abroad. Rarely do we carry out competitions with the leading shooters of the world. There is no doubt that the match of the teams of the USSR—USA—W. Germany in 1965 was very helpful, although we lost all the rifle exercises to the American team.



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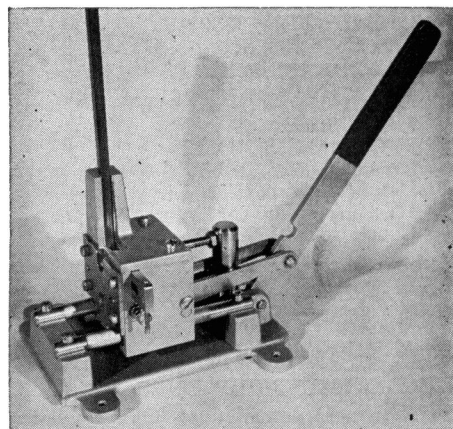
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1967 BENCH REST MATCHES

EASTERN REGION

AUGUSTA, OHIO: April 15 and 16, Bench Rest Rifle and Heavy Varmint classes. June 10 and 11, B. R. R. and H. V. July 15, (Saturday afternoon) B. R. R. and H. V. August 19, (Saturday afternoon) B. R. R. and H. V. September 16 and 17, Bench Rest Rifle—Eastern Region Championship. Reed's Run Rifle Range, Mrs. Marie Brown, Box 66, Augusta, Ohio 44607.
EASTERN, OHIO: May 6 and 7, Bench Rest Rifle (300 meter course) and Heavy Varmint classes. Chippewa Rifle Club, c/o Nelson Berger, Sec'y, Marshalville, Ohio 44645.

GREENVILLE, MICHIGAN: May 20 and 21, July 1 and 2, July 22 and 23, all Bench Rest Rifle and Heavy Varmint classes. Flat River Conservation Club, c/o Roger L. Powers, 509 Van Deine Ave., Greenville, Mich. 48838.

WAPWALLOPEN, PENNA.: May 27 and 28, July 8 and 9, Bench Rest Rifle and Heavy Varmint classes. August 29, 30, 31 and September 1, NATIONAL CHAMPIONSHIP VARMINT AND SPORTER CLASS MATCHES. Council Cup Rifle Range, c/o Robert W. Hart, 332 Montgomery St., Nescopeck, Pa. 18635.

CANTON, OHIO: June 3 and 4, August 5 and 6, Heavy Varmint class. Canton-McKinley Rifle Club, Canton, Ohio.

JOHNSTOWN, NEW YORK: June 17 and 18, Bench Rest Rifle class. August 11, 12 and 13 (three days), Eastern Region Varmint and Sporter class Championship matches. Pine Tree Rifle Club, c/o Ralph Skakel, Sec'y, 210 Burton St., Johnstown, N. Y. 12095.

FASSETT, PENNA.: June 24 and 25, July 29 and 30, September 23 and 24; all three class Varmint and Sporter; September match is Pennsylvania State Championship. South Creek Rod and Gun Club, c/o Gerald Arnold, Sec'y, R. D. #2, Gillett, Pa. 16925.

GULF COAST REGION

ABILENE, TEXAS: October 17-18-19-20, National Championship Bench Rest Rifle tournament at West Texas Sportsman Club, P. O. Box 1213, Abilene, Texas 79604, or contact J. L. Bonner, P. O. Box 606, Cross Plains, Texas 76443.

GRAND PRAIRIE, TEXAS: Gulf Coast Regional Tournaments (combined with TBRSA tournaments): Bench Rest Rifle May 13, Heavy Varmint Rifle class May 14. Sporter Rifle class August 5, Light Varmint Rifle class August 6. Grand Prairie Rifle and Pistol Club. Contact John H. Bunch, 1410 Pickwick Lane, Irving, Texas 75060.

MIDLAND, TEXAS: Texas Bench Rest Championship Matches; Light Varmint Rifle class June 3, Heavy Varmint Rifle class June 4—Sporter Rifle class July 1, Hunter

Rifle July 2 (T. B. R. S. A. registered). September 10, Hunter Rifle (Texas Championship—T. B. R. S. A. rules). Permian Basin Rifle and Pistol Club, P. O. Box 459, Midland, Texas. Contact R. C. Hanson, P. O. Box 4095, Midland, Texas 79701.

MID-CONTINENT REGION

WICHITA, KANSAS: April 29, Sat. 4 P. M. all classes. July 15, Sat. 7 P. M. Heavy Varmint (Kansas State Championship). August 12, Sat. 7 P. M. unrestricted Bench Rest Rifle (Kansas State Championship) October 8, Sunday 1 P. M. all classes. Wichita Bench Rest Rifle Club. Contact Henry W. Barton, 1841 S. Chautauqua, Wichita, Kans. 67211.

KANSAS CITY, KANSAS: May 13, Sat. 4 P. M. Heavy Varmint class. June 10, Sat. 4 P. M. Unrestricted Bench Rest Rifle. August 5, Sat. 4 P. M. unrestricted Bench Rest Rifle Regional Championship. September 9 Sat. 4 P. M. Heavy Varmint class Regional Championship. November 4, Sat. 4 P. M. Heavy Varmint and unrestricted BRRA 5-shot. Mill Creek Rifle Club, Inc., L. F. Carden, Sec'y, 5022 Waverly, Kansas City, Kansas 66104.

TULSA, OKLAHOMA: May 20, Sat. 2 P. M. Hunter's Match—May 21, Sun. 9 A. M. all classes. June 25, Sun. 9 A. M. all classes. July 22, Sat. 7 P. M. all classes. August 19, Sat. 7 P. M. all classes. September 17, Sunday 9 A. M. all classes. Tulsa Bench Rest Rifle Club, Inc., Mrs. Joan Morgan, Sec'y, R. R. #1, Box 329, Seminole, Oklahoma 74868.

MISSISSIPPI VALLEY REGION

ST. LOUIS, MISSOURI: April 9, Hunter Rifle, 10 A. M. April 22, Bench Rest Rifle and Sporter class, 3 P. M., and April 23rd, Heavy Varmint 10 A. M. May 13th, Heavy Varmint 5 P. M., and May 14th, Light Varmint 9 A. M. and Sporter 2 P. M. May 28th, Hunter Rifle 10 A. M. Mississippi Valley Regional Championship June 10th, Light Varmint 9 A. M. and Bench Rest Rifle 2 P. M., and June 11th, Heavy Varmint, 9 A. M. and Sporter 2 P. M. **SPEER MATCH** July 1st, Bench Rest Rifle 100 yards 8 A. M. and Heavy Varmint 100 yards 2 P. M., and July 2nd Bench Rest Rifle 200 yards 8 A. M., and Heavy Varmint 200 yards 2 P. M., July 22nd, Hunter Rifle 10 A. M., and July 23rd Bench Rest Rifle and Light Varmint 10 A. M. Bench Rest Rifle Club of St. Louis. Contact Arthur J. Freund, 1038 Hornsby Ave., St. Louis, Mo. 63147.

SOUTHWEST REGION

YREKA, CALIFORNIA: July 29 and 30, West Coast Championships, restricted and unrestricted Bench Rest Rifle, Heavy and Light Varmint classes. Yreka Rifle Club, contact Ray E. Jones, 508 Knapp St., Yreka, California 96097.

NORTH CENTRAL REGION

IOWA FALLS, IOWA: May 20, Heavy and Light Varmint class—night—and May 21, Sporter class 9 A. M. June 17, Sporter class—night—and June 18, Heavy and Light Varmint classes 9 A. M. July 22, Heavy and Light Varmint classes—night—and July 23, Sporter class 9 A. M. August 19, Sporter class—night—and August 20, Heavy and Light Varmint classes 9 A. M. Iowa Falls Gun Club, Lee R. Boddy, Sec'y, Iowa Falls, Iowa 50126.

BUFFALO, WYOMING: May 7, Crow Match. July 8 and 9, Mid-Year Matches, Varmint and Sporter classes, registered. August 27, Sporter Matches. September 24, Hunters Matches (not registered). Buffalo Outdoor Rifle Club, contact C. C. Hankins, P. O. Box 151, Buffalo, Wyo. 82834.

NORTHWEST REGION

SEATTLE, WASHINGTON: Registered shoots: May 27 (3 PM) and 28 (9 AM) unrestricted Bench Rest Rifle, Light and Heavy Varmint classes, 100 and 200 yards. June at 100 and 200 yards. July 16 (9 AM), unrestricted Bench Rest Rifle, 100 and 200 yards. August 13 (9 AM), Heavy and Light Varmint, 100 and 200 yards.

Non-registered shoots: April 2 (9 AM), Heavy and Light Varmint classes at 100 and 200 yards. May 7 (9 AM), Heavy and Light Varmint at 200 yards for score. September 3 (10 AM), Hunter Rifle at 100 yards. Five 3-shot matches for score and five 3-shot matches for group.

Puget Sound Benchrest Rifle Club, Inc., M. M. Oakley, Pres., 7230 So. 116th, Seattle, Wash. 98178.

1967 NATIONAL CHAMPIONSHIP TOURNAMENTS

THE VARMINT AND SPORTER RIFLE CLASS National Championship matches will be fired at the Council Cup Rifle Range, Wapwallopen, Pennsylvania on August 29, 30, 31 and September 1, 1967 (Tuesday, Wednesday, Thursday and Friday). The pre-match contact person is Robert W. Hart, 332 Montgomery Street, Nescopeck, Pa. 18635.

THE BENCH REST RIFLE CLASS National Championship matches will be fired on the range of the West Texas Sportsman Club at Abilene, Texas on October 17, 18, 19 and 20, 1967 (Tuesday, Wednesday, Thursday and Friday). The sponsoring club's address is West Texas Sportsman Club, P. O. Box 1213, Abilene, Texas 79604, or personal contact may be made with John D. Richardson, 2660 Rountree, Abilene, Texas 79601.

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TEXAS BENCH REST CLUB SHOOTS

At the winter meeting of the TBRSA and Gulf Coast Region there was noted interest in holding shoots this year with the two varmint classes along with the sporter for score.

The Permian Basin Club of Midland elected to have their monthly club shoots on the score basis. Dates for shoots in this club are the first Sunday of each month with Heavy Varmint in every shoot alternating with Light Varmint and Sporter from February.

The Grand Prairie Club of Grand Prairie, Texas, hold their club shoots on the second Sunday of each month and fire all classes provided there are enough competitors in each class.

The West Texas Sportsman Club of Abilene hold their shoots on the fourth Sunday of each month firing the Heavy Varmint and/or the Light Varmint and Sporter.

All the clubs are also holding Hunter Class shoots which have a tremendous potential in this area.

The Canyon Gun Club, P. O. Box 1013, Snyder, Texas, has scheduled the following Hunter Class shoots:—April 30, July 16, July 30, Aug. 13, Sept. 17 and Light Varmint on June 18 and Oct. 8.

HUNTER CLASS SHOOT

A Hunter Class shoot was held in Abilene, Texas, on the West Texas Sportsman Club range March 5th, firing at 100 yards and using the NRA 100 yard small-bore target. Five 5-shot matches were fired by 15 competitors. The four best aggregates were:

Red Ezell, Rule, Tex.	250-22x
Red Summers, Abilene	250-15x
Jim Gilmore, Abilene	249-19x
Leroy Butler, Abilene	249-18x

Ezell shot an issue Smith-Corona Springfield in .30-06 using 168 Gr. Sierra bullets with 56½ grs. of M-870. Summers used a Douglas barreled model 70 in 6mm/284 with 53 grs. of 4350 and 85 gr. Sierra Spitzer bullets. Gilmore fired a Douglas barreled FN 400 chambered for the 6mm McLaren which is a short blown-out 250 case using 35½ grs. of H-380 behind a 75 gr. HP Sierra bullet. Butler had an '03 Springfield .30-06 with the 168 gr. Sierra and a "case-full" of 4831.

Conditions were far from perfect as broken clouds gave continuous light variations along with wind gusts to 18 MPH switching from seven to eleven o'clock.

J. L. "Pokey" Bonner

MICHIGAN SHOOTS

The Flat River Conservation Club, Greenville, Mich., held its first Hunter Rifle shoot on Feb. 12th with 8 shooting the Hunter rifles and 3 others shooting light varmint rifles.

John Rupert and P. Henry both shot 250 possibles with light varmint, with 24 and 21 X's. Both shot 40X 222's.

With Hunter Rifle, John Budde scored a possible 250 and Fred Budde a 248, both shooting 244 Remingtons. Jack Hansing shot 247 with a .243 Sako action and Douglas barrel. Phil Langridge scored 246, shooting a 308 Mauser action and Douglas barrel, and Jim Henry a 244 with a 308 Rem. 742.

Fifteen participated in a Varmint Match on Feb. 26th. Roger Powers had high aggregate of 245, shooting a .225 with re-enforced Mauser action and Hart barrel. Jim Henry was runner-up with 243, shooting a .22 (? wildcat) with Win 70 action and Douglas barrel. Ray Novak had a 227 with a 30-30, Mauser action and GI barrel. Bob Simonson had 4th place 221 with a 22-250 FN Benchrest action and Douglas barrel. Weather was reported "beautiful" but with tricky, troublesome winds.

PENNSYLVANIA SHOOTS

The fourth match of the Winter League (bench rest) at South Creek Gun Club, Fassetts, Pa., was held February 26 with seventeen shooters participating. Top and bottom aggregates were:

1st—C. Lawley	.4914
2nd—R. Hart	.5302
3rd—J. Stekl	.5720
4th—R. Otis	.6004
5th—J. Arnold	.6073
17th	.9510

The fifth match of this Winter League on March 12th, with thirty shooters, had results as follows:

1st—J. Arnold	.3916
2nd—R. Hart	.4058
3rd—L. Hunt	.4538
4th—J. Stekl	.4602
5th—C. Lawley	.5006
30th	1.4880

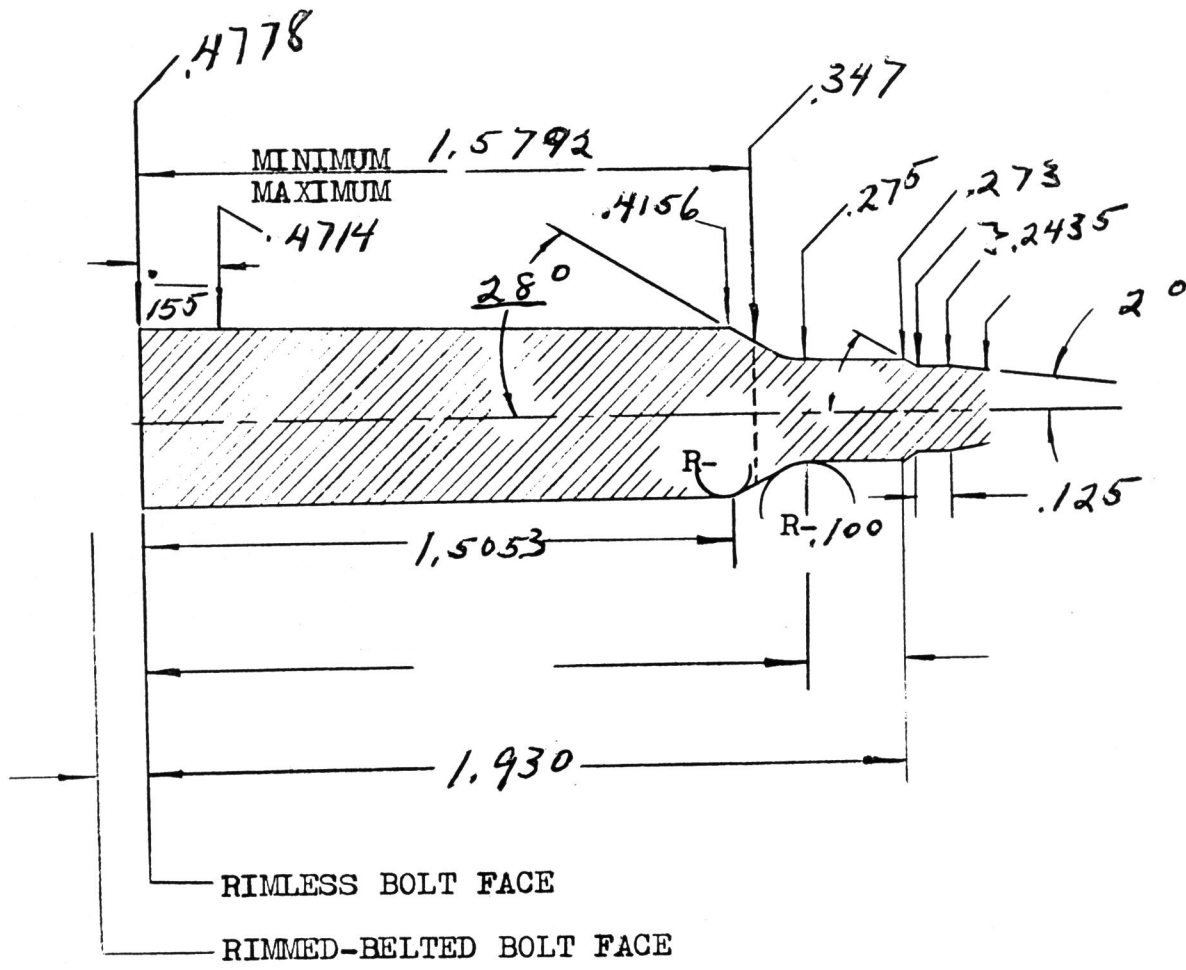
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A LETTER FROM GEORGE FULLMER

Enclosed is a sketch of the 6mm-250 case as I have it here. My reamers are made by Elliott, in this case. Both Keith Francis and Sam (L. E.) Wilson have the specifications and can make them up on order. Those of us doing accuracy shooting recommend that the above people make up the reamers as R. C. B. S. has the specifications and can make up precision dies, also.

The case is actually a misnomer as we used 22-250 angle and body dimensions. Due to copyright we could not call it "Varminter."

For true accuracy in 6mm it is our belief that the 6mm Donaldson International, 6mm-225 Win. and 6mm Walker International are cases that will give less copper wash in barrels. Using a Hart barrel, I have yet to see a 6mm Don. Int. copper wash a barrel. The same for a 6mm-219 Don.

For pure accuracy I do believe the above cases are better. However, they are not legal for Hunter Target Matches. It is our belief that the above cases will be able to compete with the .224 and Match .30 cases when we are able to get comparable bullets.

Yesterday (Feb. 26th) at our Hunter Targets Match at Richmond (Calif.) we had two 100 possibles shot in the match (two consecutive 5-shot scores of 50 on the 50 meter International target). One of these scores was shot by Bill Haines of Moss Beach and the two 5-shot groups measured .430" and .325". The other was shot by Floyd Workman of Santa Cruz. I scored the targets but do not have the group measurements. This shooting called for not only good grouping but also for bullet placement. Using a 6-47 with 24X Unertl in a 10½ lb. rifle to shoot like this would not cause any comment—but try it

some day with a case that has a bit of recoil and use a 6X scope. Both shooters used 700-722 actions and Weaver K6 scopes. Floyd used Rem. bullets and Bill used Sierras. Both rifles have Hart 1-12 barrels. Both rifles were chambered by a local gunsmith that is interested in accuracy shooting.

Burt Farrell of Union City won the match using a .308 barreled by Titus—the first barrel seen this area of Bliss Titus. It also took our State Match last month (January) and caused considerable commotion by our Hart barrel contingent. Before the match was over, however, two of our local Hotshots had orders in to Clyde (Hart) for .30 cal. 1-14 barrels to see how much increase in scoring they would get using a .30 bullet over a 6mm.

My good friend Ben Underwood said yesterday: "When we started in with this shooting 3 years ago we considered it lucky to stay in the 8 ring of the (50 meter) International target—today I went out that far twice and only placed third—damned near didn't place."

It is very true, when I scored our first targets 3 years ago I did not dream at that time that we would interest so many people and show such good progress. At this time I am going to predict that if we continue to use the 50 meter smallbore ISU target at 100 yards for this shooting, before two years are out we will have at least one 250 possible (aggregate).

The people that have entered this (shooting program) are not local Homer Culvers. Hobbs and Suchan have not entered, basically to give newcomers a taste of Bench accuracy without "expert" competition. These people have developed their own EXPERT CLASS and they ARE GOOD.

At this time many shooters are going to shorter barrels. I do not say heavy barrels as no one has as yet been able to define a heavy barrel. I am making up several using this formula; 1.2" for 4" then taper to .700" at 24" or less. We work out the weight of the gun by cutting off from the breech end of the barrel.

The people that claim these are not practical hunting rifles should shoot one. In a 10½ lb. rifle of this type in 6mm Donaldson International a 75 grain bullet averaged out 3510 fps on R. C. B. S. chronograph. As Don Squires said, anyone that cannot kill deer with that does not belong in the woods. The 6mm-250 is close to 3650. These velocities have been reported to me on these cases. I cannot vouch for them. I care not one whit for velocity—we are interested in accuracy and if we cannot HIT, no matter how fast, a miss only scares as the bullet goes past.

We have at this time also considerable interest in the potential of Speer's 130 grain .30 caliber bullet as against the heavy BT types. I remember a test I ran on

yards Speer's 130 grain bullet gave us ½ inch groups.

At this time, for good accuracy, light recoil and ability on deer sized game, the 6mm-250 will be a hard cartridge to beat.

It is believed that the action locked up in back, like the new 788 of Remington is not as truly accurate as their 700. There is also belief—well founded—that an important part of accuracy is in the bedding. The 788 appears quite stiff. It could be that the importance of bedding will overcome what loss in accuracy there will be in the rear locking. We notice the 788 has a lightened firing pin, and as soon as we saw this we wondered how many 700's would be skeletonized. Realizing the trigger (of the 788) was designed for a rifle to sell for a price, we believe that if Canjar and Timney are on the ball they will have a trigger available for this model right soon.

Several accurate rifles have been made up on the 110 Savage action. Its main drawback for accuracy shooting has been the poor trigger furnished. With so many shooters buying rifles just to throw away the barrel and stock it is a shame that no one has brought out or at least publicized a GOOD trigger for this action.

.25 CALIBER HART BARRELS AVAILABLE

We have confirmed a report that Hart barrels in .25 caliber were to be available. HART RIFLE BARRELS, INC. advise that they are now accepting orders for their stainless steel barrels in .25 caliber. Present delivery delay may be 3 to 5 weeks.

Rifling twists for .25 caliber will be 10 and 12 inch. If they fit barrels to customer's action they are prepared to chamber for .257 Roberts, .257 Improved and .25/06.

If interested, write for brochure to HART RIFLE BARRELS, INC., R. D. #2, LaFayette, New York 13084. P. H. T.

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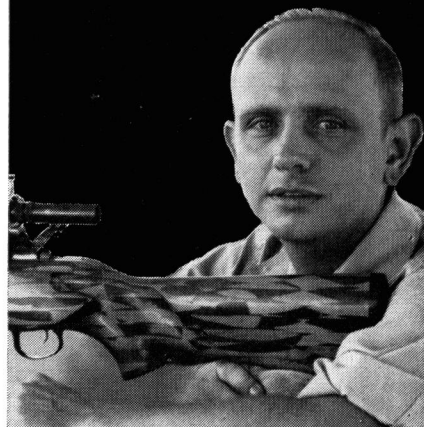
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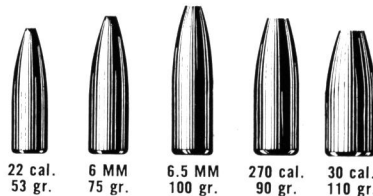
Tom Gillman has broken 9 World Records (N.B.R.S.A.) with Sierra Bullets. Here are some of his record 5-shot groups:

- HEAVY VARMINT
.1923" at 200 yds.
(using Sierra's .22 cal., 53 gr. H.P.)
- SPORTER
.137" at 100 yds.
.372" MOA; 200 yd. Aggregate Record.
.4131" MOA; 5 groups 100 yds. & 5 groups 200 yds.
(using Sierra's 6 MM, 75 gr. Hollow Point)

Mr. Gillman also won the following NATIONAL MATCHES with these record 5-shot groups:

- 3-GUN AGGREGATE VARMINT & SPORTER
1964, Abilene, Tex.; 1966, Midland, Tex.
- HEAVY VARMINT
1964, Abilene, Tex.; 1965, Johnstown, N. Y.
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MATING CARTRIDGE NECK TO CHAMBER FOR SUPERIOR ACCURACY

By Henry H. Moore
Fort Worth, Texas

I will attempt to answer Mr. Roger S. Norris' question concerning uniform case neck thickness (February 1967 P. S.)

I believe that turning or reaming a case neck to achieve uniform thickness is of little use as it only thins the neck and sizing. I will describe a method of neck fitting which has been used successfully for about the last three years by some bench rest shooters.

Some of the reasons for going to all this trouble and expense are; 1) longer case life, 2) no split necks, 3) concentric rounds (provided a chamber type seater is used), 4) case neck serves as a guide until the bullet has completely entered the bore, 5) it eliminates any necessity for neck sizing which often disturbs concentricity of neck and case.

Now, on with the project.

First, one must chamber the rifle in such a manner as to leave little or no clearance between the case neck of a loaded round and the mating diameter in the chamber. This makes it necessary to grind, or have ground, the neck portion of the reamer to a smaller diameter so that the cases to be used can be turned and fitted with minimum clearance. Leading reamer manufacturers are familiar with this modification.

Suppose we use the 6.5x55 as an example for the sake of having a practical set of dimensions.

Use a 6.5x55 reamer with the neck portion ground to .290"; chamber the barrel and with a hole gauge or some suitable means, determine and record the exact diameter of the neck portion of the chamber before making up barrel and action.

It is best to have a reamer ground to a dimension which will require that case necks be twelve to thirteen thousandths of an inch thick provided the brass to be used will clean up at that diameter.

Now you have a rifle which will not accept a standard case, so chuck a piece of mild steel in the lathe and turn and polish it to a diameter of .263" for a distance of about 3/4", then champfer the end. Next, start a case on the mandrel with the tail stock and tap until it runs reasonably true, then force it farther until one is sure the entire neck is on the mandrel.

Next, turn the neck to the diameter of the chamber at this point (about .290").

Cases can be removed from the mandrel with a shell holder type notch in the end of a piece of flat steel, or with a shell holder type of fitting chucked in the tail stock.

Load all the cases, remove firing pin from bolt, and with fine sand paper or emery polish each case neck until they will chamber with little or no interference, being sure no grit is carried into the chamber by the round.

By using .263" diameter mandrel and turning the neck to the size of the chamber, we have a .001" press fit on a .264" diameter bullet, which when seated expands the neck to an outside diameter of .2905—.291, creating stock for selective fitting.

I believe eccentricity in a loaded round is the chief cause for having to select cases. This method of fitting practically eliminates that problem. For once a case is fired it stays pretty close to the shape it occupied when under pressure.

Don't resize necks. Just punch out old primer and load as usual, and if you have carefully fitted your brass you will find the cases will hold the bullets securely and will continue to do so until erosion on the inside thins necks to the point where they will no longer hold a bullet. With moderate loads, I find case life to be 50-100 firings.

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ANOTHER ANSWER FOR ROGER NORRIS

By Robert A. Greenleaf
Westfield, Mass.

I imagine you have received quite a few responses to your cry for help in regards to Mr. Norris' queries but I'd like to add my own thoughts and observations.

I have found that uneven neck (wall) thickness can be corrected more accurately by outside neck turning than by reaming. The Forster neck turner, when used properly, will true-up necks so that the variations will not exceed .0003". Dipping the necks in lacquer thinner immediately before turning will allow the tool to cut quicker and cleaner and prevent galling of the inside of the neck on the pilot. The necks **MUST** be resized all the way to the shoulder before turning.

The neck diameter should be .004" to .006" smaller than the chamber. The only way to arrive at this is to make a chamber cast. This cast should be long enough so that the condition of the leede can also be examined as its condition is important for accuracy.

The turning tool should be adjusted so that it barely removes any brass from

the thin side of the neck but in spite of this it will sometimes be found that the brass thickness is such that the loaded case will measure less than .006" less than the chamber. In this situation all that can be done is to determine how they shoot compared to cases that are at the optimum diameter. I consider the Starrett No. 220 multi-anvil micrometer the best instrument to measure neck (wall) thickness with and it is a very useful tool for the gun-bug or around the shop.

If a person has, say, 100 cases that are all the same neck thickness he should send one or two to RCBS for a neck sizing die that is .002" smaller than the loaded case neck diameter so that the brass will not be worked excessively. Cold working of brass as occurs during resizing hardens the neck and hastens the need for annealing. The concentricity of the die is assured by the brand name so is not a matter of concern. A Vickerman bullet seater or a Wilson straight-line seater is to be preferred to the conventional seaters for best results.

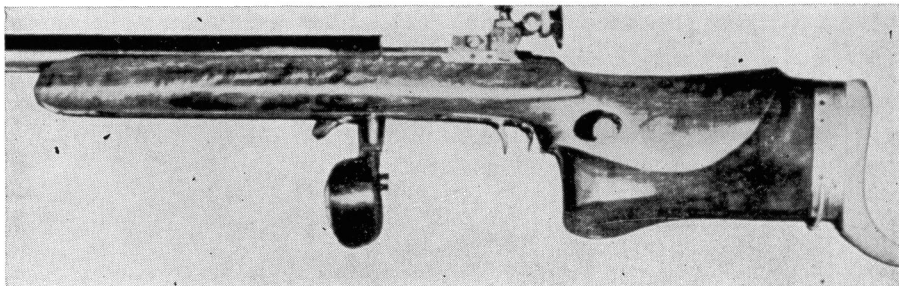
If the headspace is close to minimum and the cases are gaged in a case gage (Wilson or Forster) to be sure the cone to head distance is not too short then the cone of the case must be supported by the cone of the chamber which means that, at least, the front end of the case is centered and not lying on the bottom (of the chamber). Since the counterbore in the bolt face, if such exists, has to be larger than a maximum diameter cartridge, for obvious reasons, the rear of the case will rest on the chamber bottom but the expansion due to powder gases is equal radially the case will tend to center itself during firing. If after firing there is evidence of uneven expansion in front of the solid had (of the case) it usually means that the case was held off center. A Mauser-type extractor is a common cause of such problems. Spring actuated ejectors can tend to force an un-fired cartridge off-center besides damaging the neck as the case is extracted from the chamber. (Such rifles) should have the ejector assembly removed. An ejector is more of a nuisance than anything else on a bench rest rifle.

I don't believe it is possible to do a good job of lapping locking lugs with the barrel on. Remove the barrel and do the job properly and clean the lug recesses completely when finished. With the barrel off the chamber cast can be made much more easily, also the end of the chamber can be rounded slightly, if necessary, to facilitate feeding and minimize scratching of the cases. Lapping of the lugs should not be done without headspace gages because if done too vigorously the maximum headspace may be exceeded. It might be a good idea to put off the job until re-barreling or re-chambering is necessary at which time everything can be done properly.

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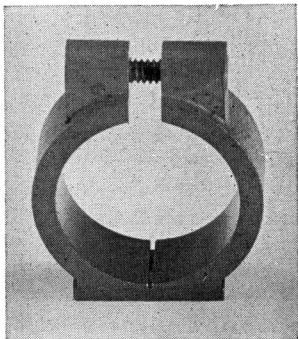
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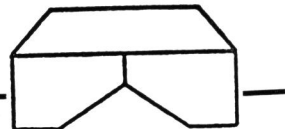
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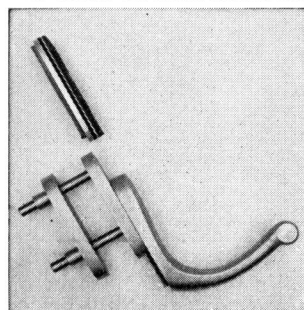
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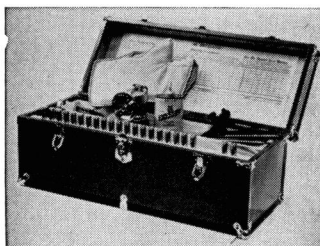
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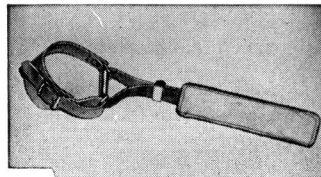
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REGARDING NECK REAMERS AND REAMING

By L. E. Wilson, Cashmere, Wash.

The contribution on page 15 of the March issue of PS needs some clarifying. Mr. Darrow says, "There are no line reaming jigs on the market that can be used to correct case neck eccentricity. The ones offered by RCBS, Forster and Wilson allow the reamer to float in the existing hole." The objection I have to this statement is that our neck reamers are called "line reamers."

The instruction sheet which is furnished with each reamer states, "It should be understood that these are not 'line reamers,' that they are not designed for the purpose of correcting case necks which are thicker on one side than the other. These reamers are centered and guided by the inside of the case neck. If the inside is not

concentric with the outside it will remain that way. They are primarily a safety item, having to do with clearance and not alignment. The fact that they contribute to accuracy by eliminating loads that would otherwise give excessive pressures is incidental to their main purpose."

In the past I have made up a few line-reaming devices on special order and these will positively correct neck wall variations. However, they are too expensive for the average shooter and are not advertised in our literature. In addition, I don't advise line-reaming or outside turning of case necks unless such cases are used in a special chamber having a smaller neck diameter than standard. Most factory chambers already have too much neck clearance for reasonable case neck life and to add to this clearance by reaming or turning will hasten neck splits. Line-reaming, in my opinion,

is to be preferred over turning in that the reamer goes all the way in and doesn't leave a tight spot inside the neck at the junction of neck and shoulder. Important if bullets are seated deep enough to contact this tight spot. Not important otherwise.

From letters I receive, many shooters seem to feel they will get better centering of the case in the chamber if the neck is a uniform thickness all around. This would be true if the neck and chamber were in contact but with the necessary clearance at this point there is no centering effect. The best centering of the cartridge in the chamber is obtained by neck sizing only and seating the bullets true with the case body and just deep enough to clear the throat or ball seat. Then the bullet is supported dead on and ready to depart in a straight line.

ALOX BEESWAX BULLET LUBRICANT

Early in the winter Mr. John Cain, Kensington, Md. sent a sample can of the Alox Beeswax bullet lubricant that he advertised in the December and January TRADIN' POST for testing.

I have never done any bullet casting and haven't done any cast bullet shooting for several years past. However, I knew that Mr. Carl W. Johnson, Jr., Ellsworth, Kansas is a cast bullet shooter and experimenter so I sent him the sample can of lubricant and requested that he give his opinion of it after he had been able to try it. Mr. Cain packages his lubricant in a 12 oz. can instead of in stick form—the can is said to equal six sticks.

Mr. Johnson recently reported his testing of the product. He had previously used an alox beeswax lubricant from another maker which was sold in stick form. He found no trouble using the Cain product—simply melted the lubricant in the can and poured it into the lubricator. He did shooting in .30-06 rifles with two, four and five groove barrels, a .250/3000 with 12" twist and a .25/06 with 12" twist.

His records indicate tighter groups at low velocities when using an alox beeswax lubricant than with lubricants he had formerly used. At velocities in the 2000 fps range, bullets lubricated with the alox beeswax products gave no leading troubles and barrels stayed clean for a considerable number of rounds.

Mr. Johnson considered Mr. Cain's product at least equal to that of the other maker, whose product he had used, and that Mr. Cain's packaging in a can instead of in sticks provides a significant favorable price differential.

Incidentally, Mr. Johnson mentioned having very recently received a .308 caliber rifle with 1 in 15" twist which he had made especially for cast bullet shooting by Mr. Hobaugh in Montana. He promises to report the results he gets with that rifle after he has had opportunity to thoroughly test it—that should be interesting information.

P. H. T.

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IS THE BIGBORE COMING BACK?

By Fred W. Hallberg

In this case bigbore does not refer to the modern concept of that term, such as the .30-06, but rather to the true bigbores of which the .45-70 is the best known example. My observation covers Minnesota only but here, at least, I have seen so many .45-70s (the number becomes greater every year) that I can't help but wonder whether the user of such rifles is just a special breed of shooter or whether the .45-70 is really making a comeback. Of course, Minnesota is particularly favorable of such a caliber. Our annual harvest of deer is probably the greatest in the Union and, due to the heavy brush of the deer country, most are taken within fifty or seventy-five yards. For such shooting the bigbore bullet is almost ideal. Many owners of such rifles also bring them out to their local ranges and,

at the small 200 yard range on which I shoot, I have seen as many as three or four show up at one time.

Most of these .45-70s are assembled locally on surplus rolling block or Martini actions and a fewer number on Winchester, Stevens, and other of the old single-shot falling block varieties. Not any of the rifles fired on our range have produced outstanding groups, but here and there throughout the state we do run into .45-70s that are quite capable of giving an acceptable account of themselves against any competition. I recall as a boy, some fifty years ago, seeing some riflemen effectively compete with their .45-70s at 500 yards against the .30 caliber of that day and most of us have read of remarkable 1,000 yard performances by the .45-70 at the turn of the century. And what about that story of the Yankee captain who picked off a Confederate general at a range of one mile? This may not have been a .45-70 but it was a bigbore bullet.

So we know the bigbore can shoot. And we also know the .45-70 is an easy cartridge to reload, that lead bullets for it can readily be molded, and that such bullets are very effective in the hunting field. For some reason, the bigbore is also a lot of fun to shoot.

In trying to recapture the old effectiveness of this caliber, some of our shooters have searched the field for a modern weapon in which .45-70 loads can be fired. The best they have been able to come up with is the Winchester .458. With this gun they can make beautiful ragged one-hole five-shot groups at 50 yards, but beyond that range results become progressively poorer. Many of these shooters are skilled target shots—yet it seems that nothing they can do will improve results. I have looked at one such rifle and have wondered if the poor results obtained may not be due to too fast a rifling pitch. The Winchester model 70 .458 has a twist of one turn in 14 inches. The .45-70 target rifle had a twist in the neighborhood of 22 or more inches. Now the .458 was designed to shoot a shorter bullet at higher velocity than the .45-70 and yet the bullet is made to revolve at a higher rate than the old slow moving soft coal burner. This seems contrary to everything we have learned about exterior ballistics. Some of us have been looking longingly at the new Ruger .458 single shot, but before we invest a lot of hard-to-get dollars we want to make certain that the barrel is properly designed. Perhaps some reader can enlighten us on this subject.

According to one Washington report, a tentative meeting of the sub-committee is scheduled for March 22. It was also reported that liaison work on amendments is being conducted at the subcommittee staff level.

If amendments are actually made to S. 1592, it will probably be a week or more before printed versions are available to the public.

10-X

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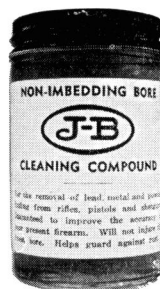
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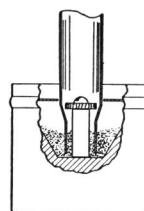
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50 gr. spire & SX



53 gr. spire HP



55 gr. spire & SX



60 grain spire point



70 grain spire point



75 gr. spire HP



87 grain spire point

6MM CAL. (.243)



25 CALIBER (.257)



60 grain soft point



75 gr. spire HP



87 grain spire point

6.5 MM CAL. (.264)



100 grain spire point

270 CALIBER (.277)



100 grain spire point

7MM CAL. (.284)



120 grain spire point

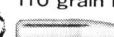
30 CALIBER (.308)



110 grain spire point



110 grain round nose

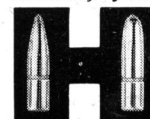


130 grain spire point

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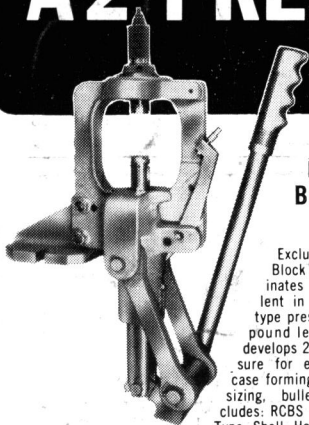


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